# Reintroduction of Brown-headed Nuthatches and Eastern Bluebirds to Everglades National Park

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The pine rockland ecosystem, dominated by the southern slash pine (*Pinus ellioti var. densa*) forest, is a critically endangered habitat in southern Florida. Along the Miami rock ridge, over 90% of this ecosystem was obliterated in the early 1900's from agricultural and residential development. The largest and only functional remaining tract is the 4,600 ha of pine forest in Long Pine Key, Everglades National Park. The most glaring losses to the pine rocklands has been the extirpation of four endemic bird species, all cavity-nesters: Brown-headed Nuthatch (*Sitta pussila*), Eastern Bluebird (*Sialia sialis*), Red-cockaded Woodpecker (*Picoides borealis*), and Southeastern American Kestrel (*Falco sparverius paulus*). A fifth cavity-nester, the Hairy Woodpecker (*Picoides villosus*) is extremely rare. Although habitat loss is a major factor in these extirpations, other contributing factors probably include altered fire regimes, effects associated with isolated small populations and the influence of a warming climate at the southernmost extent of these species' ranges. More importantly, however, the large distance between remaining isolated habitat islands from source populations has likely precluded recolonization by these species.

In 1997, a two-year experimental reintroduction project was initiated to develop and implement translocation techniques aimed at restoring viable populations of Brown-headed Nuthatches and Eastern Bluebirds. This project serves as one test of the progress made in restoring the rare pineland ecosystem represented by Long Pine Key. During this study, 20 nuthatches and 15 bluebirds (12 adults:3 juveniles) were released to Long Pine Key. Breeding and successful reproduction occurred in both years under natural conditions. At the end of the second breeding season, three nuthatch territories and two bluebird territories were established, which produced 12 and 6 juveniles, respectively. In general, hard-releases (1-3 days) from smaller cages were most effective for nuthatches, while soft-releases (1-3 weeks) from larger aviaries were effective for bluebirds. Moving bluebird pairs and their nestlings also proved to be an effective translocation technique. With effective translocation techniques developed, a long term reintroduction plan was developed.

The primary goal of the long-term reintroduction plan is to translocate approximately 100 individuals of each species to Long Pine Key. Because newly established populations are small and vulnerable the plan proposes moving 20 individuals of each species over a four-year period to increase population size as quickly as possible. During the first year, 14 nuthatches and 26 bluebirds (17 adults:9 juveniles) were released to Long Pine Key. At the end of the breeding season, 8 nuthatch and 4 bluebird territories had produced 22 and 16 juveniles respectively. Demographic, reproductive, and habitat use data from the reintroduced and donor population will be used to evaluate restoration of the pine rockland ecosystem in Long Pine Key and to test hypotheses concerning population biology.

In 1996, the South Florida Ecosystem Restoration Science Subgroup identified the loss of species from upland communities as a critical restoration issue and declared the investigation of reintroductions to restore biotic losses in upland communities as a critical information need.

Moreover, in the 1996 "Report of the Panel to Evaluate the Ecological Assessment of the 1994-1995 High Water Levels in the Southern Everglades" an independent panel noted that restoration efforts cannot concentrate only on the "River of Grass" while ignoring the remaining upland forest fragments. The panel specifically identified reintroduction of upland species lost from the Everglades as a necessary part of restoration. This ongoing project, thus, addresses a critical information need for South Florida Ecosystem Restoration, as stated by the Science Subgroup and implements the High Water Independent Panel's recommendations. Continued support of reintroductions of pineland species and other pineland projects will indicate that public officials are serious and committed to incorporating the endangered pine rockland ecosystem as part of the Greater Everglades Ecosystem Restoration effort.

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